AMENDMENTS TO THE CLAIMS

1-3. (Canceled).

4. (Currently Amended) An ICP source for a semiconductor wafer plasma processing apparatus comprising:

an RF generator;

a series RF circuit that includes a substrate support and a peripheral ionization source, including at least one inductive element that generates an RF magnetic field into a plasma, connected to and surrounding the substrate support on the periphery of the substrate support, the substrate support and the peripheral ionization source forming a common planar surface having a substrate support surface at its center;

a matching network coupling the RF generator into the series RF circuit;

the RF generator coupling RF energy to the series RF circuit to bias the substrate support surface to capacitively couple to the plasma proximate the planar surface and to energize the peripheral ionization source to inductively couple to the plasma proximate the planar surface, thereby forming a high density plasma across the planar surface by both capacitively and ~~inductively coupling~~ inductively-coupling energy thereto from the series RF circuit; and

a slotted Faraday shield between the inductive element and the plasma for facilitating the inductive coupling of energy from the inductive element into the plasma and for limiting the capacitive coupling of energy from the inductive element to the plasma**[[,]]**;

wherein the peripheral ionization source includes an annular antenna that surrounds the substrate support surface and is capacitively-coupled in series with the substrate support surface to form the RF series circuit; and

wherein the RF generator is connected to the substrate support through the matching network.

5. (Canceled)

6. (Currently Amended) An ICP source for a semiconductor wafer plasma processing apparatus comprising:

an RF generator;

a series RF circuit that includes a substrate support and a peripheral ionization source, including at least one inductive element that generates an RF magnetic field into a plasma, connected to and surrounding the substrate support on the periphery of the substrate support, the substrate support and the peripheral ionization source forming a common planar surface having a substrate support surface at its center;

a matching network coupling the RF generator into the series RF circuit;

the RF generator coupling RF energy to the series RF circuit to bias the substrate support surface to capacitively couple to the plasma proximate the planar surface and to energize the peripheral ionization source to inductively couple to the plasma proximate the planar surface, thereby forming a high density plasma across the planar surface by both capacitively and ~~inductively coupling~~ inductively-coupling energy thereto from the series RF circuit; and

a slotted Faraday shield between the inductive element and the plasma for facilitating the inductive coupling of energy from the inductive element into the plasma and for limiting the capacitive coupling of energy from the inductive element to the plasma**[[,]]**;

wherein the matching network is capacitively-coupled to the substrate support surface,

wherein the peripheral ionization source is capacitively-coupled to the substrate support surface and is capacitively-coupled to the chamber ground; and

wherein the RF generator is connected to the substrate support through the matching network.

7-8. (Canceled)

9. (Currently Amended) An ICP source for a semiconductor wafer plasma processing apparatus comprising:

an RF generator;

a series RF circuit that includes a substrate support and a peripheral ionization source, including at least one inductive element that generates an RF magnetic field into a plasma, connected to and surrounding the substrate support on the periphery of the substrate support, the substrate support and the peripheral ionization source forming a common planar surface having a substrate support surface at its center;

a matching network coupling the RF generator into the series RF circuit;

the RF generator coupling RF energy to the series RF circuit to bias the substrate support surface to capacitively couple to the plasma proximate the planar surface and to energize the peripheral ionization source to inductively couple to the plasma proximate the planar surface, thereby forming a high density plasma across the planar surface by both capacitively and ~~inductively coupling~~ inductively-coupling energy thereto from the series RF circuit; and

a slotted Faraday shield between the inductive element and the plasma for facilitating the inductive coupling of energy from the inductive element into the plasma and for limiting the capacitive coupling of energy from the inductive element to the plasma**[[,]]**;

wherein the peripheral ionization source is capacitively-coupled to the substrate support surface,

wherein the RF generator is connected to the substrate support through the matching network; and

wherein the matching network has impedances in series with the peripheral ionization source that are approximately tuned to the frequency of the RF generator.

Claims 10-26. (Canceled).